REMARKS

Reconsideration and allowance of the subject application in view of the following remarks is respectfully requested.

Claims 5-9 and 14-20 are pending in the application. The claims remain unchanged notwithstanding the Examiner's art rejections which are deemed to be in error.

More particularly, the Examiner rejected claims 5, 6, 9, 14, 15 and 18-20 as being anticipated by Coffman (6,451,627). Applicants respectfully traverse these rejections because Coffman fails to teach or disclose all limitations of independent claims 5 and 14, i.e., (1) the photoresist layer is formed on ***the half-etched metal layer***, (2) the metal coating is formed on the surface of ***the half-etched metal layer*** which is not covered by the photoresist; and (3) ***the sheet carrier is removed*** after a package body is formed. Note that **half-etched metal layer** means **a metal layer which is half-etched to form concavities at predetermined positions thereof** (see step (b) described below).

The present invention is directed to methods of making a low-pin-count chip package. According to the present invention, the method comprises the steps of: (a) laminating a metal layer on a sheet carrier; (b) **half-etching the metal layer** so as to form concavities at predetermined positions thereof; (c) forming a photoresist layer on the **half-etched** metal layer; (d) half-removing the photoresist layer such that only photoresist within the concavities is left; (e) forming a metal coating on the surface of the **half-etched** metal layer which is not covered by the photoresist; (f) stripping the remaining photoresist within the concavities; (g) etching the **half-etched** metal layer with the metal coating as a mask so as to form a plurality of connection pads (and a die pad (claim 14)) having a substantially concave profile; (h) attaching a semiconductor chip onto the sheet carrier (claim 5); or attaching a semiconductor chip onto the die pad (claim 14); (i) electrically coupling the semiconductor chip to the connection pads; (j) forming a package body over the

semiconductor chip and the connection pads; (k) **removing** the sheet carrier after the package body is formed; and (l) forming a protective metal flash on the lower surface of the connection pads exposed from the package body. *See* present claims 5 and 14.

The Examiner alleged in page 3 of the Office Action that Coffman shows, in col. 2, line 59 to col. 3, line 20, a step of forming a photoresist layer (Fig. 3, 32) on the half-etched metal layer. However, *in Coffman's patent, the photoresist layer 32 is applied to overlay the surface 23 (see Fig. 2) of the metal sheet 20 (see Col. 2 line 60-63) which is **not** subject to any etching process.* In contrast, the photoresist layer of the instant invention is formed on a metal layer which is ***half-etched*** to form concavities at predetermined positions thereof (see Fig. 5 of the instant application).

The Examiner alleged in page 3 of the Office Action that Coffman shows, in col. 3, lines 2-6, a step of forming a metal coating on the surface of the half-etched metal layer which is not converted by the photoresist. However, *in Coffman's patent, the metal coating 31 is formed on copper 29 which is **selectively plated** in the openings (see Fig. 3; Col. 2, line 63-65) provided in the layer 32 (see Col. 2, line 67 to Col. 3, line 4).* In contrast, the metal coating of the instant invention is formed on the surface of the ***half-etched*** metal layer which is not covered by the photoresist (see Fig. 7 of the instant application).

Furthermore, Coffman does not teach or suggest a step of removing the sheet carrier after a package body is formed since the sheet carrier 126 in Coffman is only partially etched (see Fig. 17 Coffman) but not removed as presently claimed.

Therefore, Applicants respectfully submit that Coffman fails to teach or disclose each and every limitation of claims 5 and 14, and it is respectfully requested that the anticipatory rejections be withdrawn.

Since it has been shown that claims 5 and 14 define over the art, Applicants request withdrawal of the rejections of claims 6, 9, 15, and 18-20 under 35 U.S.C. 102(e) as they depend

from independent claims 5 & 14.

Rejection of claims 7, 8, 16 and 17 under 35 USC § 103(a) as being unpatentable over Coffman (6,451,627) in view of Bernier et al. (6,251,707) and Bunyan (U.S. Pub. 2002/0012762).

This rejection is traversed, at least for the reason mentioned above.

In addition, Applicants respectfully submit that the applied references singly or in combination fail to disclose, teach or suggest the invention of claims 19 and 20.

Claims 19 and 20 require that the sheet carrier be **completely removed** after the package body is formed. This means the sheet carrier is not present in the product after the package body is formed. The applied references, especially *Coffman*, clearly fail to disclose, teach or suggest this limitation. The Examiner argued that element 126 in Fig. 12 of *Coffman* is readable on the claimed sheet carrier, and that column 6, lines 28-38 and Fig. 17 of *Coffman* teach the claimed step of removing the sheet carrier 126. *See* pages 2 and 4 of the Final Office Action. However, as can be seen in Figs. 16 and 17 of *Coffman*, sheet carrier 126 is not completely removed as required by claims 19-20. Rather, the sheet carrier 126 is only partially removed in regions that are not covered by metal layer 140. The sheet carrier 126 is still present in the product after the package body is formed. *See* elements designated with 126 in Fig. 17 of enclosed Exhibit A. Accordingly, Applicant respectfully submits that the applied references fail to disclose, teach or suggest the invention of claims 19 and 20, and that claims 19-20 are clearly patentable over the applied art of record.

Accordingly, all claims in the present application are now in condition for allowance. Early and favorable indication of allowance is courteously solicited.

The Examiner is invited to telephone the undersigned, Applicant's attorney of record, to

facilitate advancement of the present application.

To the extent necessary, a petition for an extension of time under *37 C.F.R. 1.136* is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 07-1337 and please credit any excess fees to such deposit account.

Respectfully submitted,

LOWE HAUPTMAN GILMAN & BERNER, LLP

Randy A. Noranbrock *for:* Benjamin J. Hauptman
Registration No. 42,940 Registration No. 29,310

USPTO Customer No. 22429
1700 Diagonal Road, Suite 310
Alexandria, VA 22314
(703) 684-1111 BJH/KL/klb
(703) 518-5499 Facsimile
Date: November 19, 2003

Exhibit A

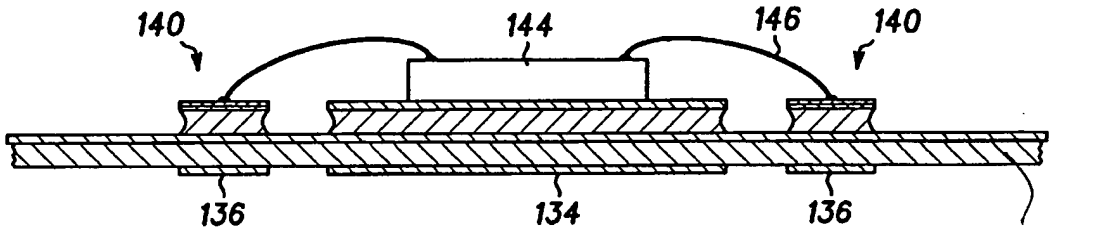

FIG. 15

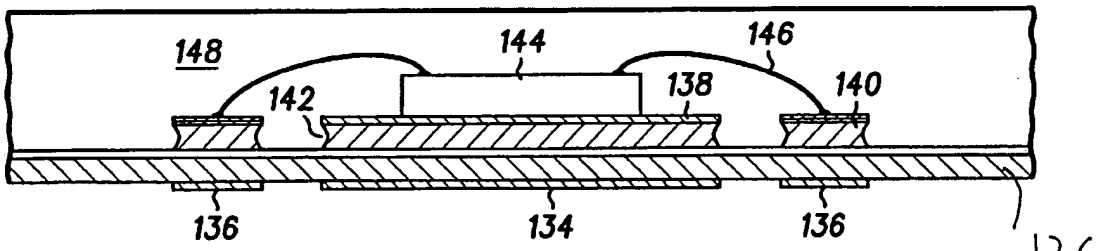

FIG. 16

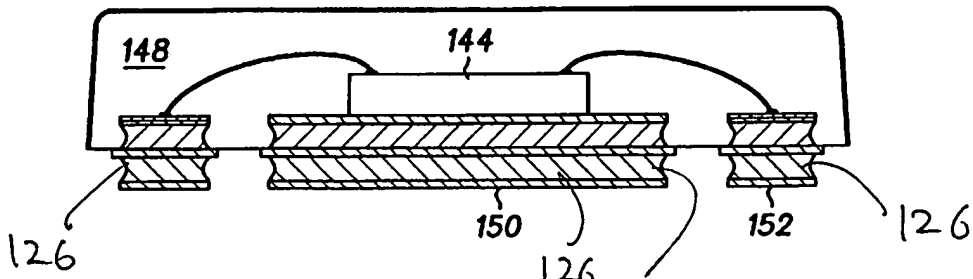

FIG. 17

Cu